

### **REMARKS**

At the outset, the Applicants appreciate the thorough review and consideration of the subject application. The Final Office Action of December 1, 2005, has been received and its contents carefully noted. Claims 1-8 are currently pending. Reconsideration of the rejected claims in view of the above amendments and the following remarks is respectfully requested.

Entry of these Remarks is respectfully requested as it places the present application in condition for allowance, or in the alternative, better form for appeal. In view of the following Remarks, Applicants respectfully request reconsideration and timely withdrawal of the pending objections and rejections for the reasons discussed below.

Claims 1-8 were rejected under U.S.C. § 103 over the Kawanishi '865 patent in view of the Kawanishi '966 patent. Claim 1 is directed towards a polarization-maintaining photonic crystal fiber. Specifically, claim 1 recites a combination of elements, including, for example,

a clad layer surrounding the core, the clad layer including a large number of thin holes extending along the axis of the fiber, the thin holes being arranged in a crystalline formation; and

...

wherein the over clad layer has a marking portion for indicating a polarization plane to be maintained,

wherein polarization of light propagating through said core is maintained exclusively by said thin holes in said clad layer.

None of the applied references either singly or in combination teaches or suggests at least these features.

The Examiner states the Kawanishi '966 patent discloses,

a marking portion (A2, figure 14) is a pair of opposing holes in the over clad layer extending along the axis of the fiber and spaced apart from the thin holes in the clad layer for indicating a polarization plane to be maintained and the marking portion has circular cross section and is made of material having a refractive index different from that of the material of the over clad layer (column 6, lines 20-26).

In contrast to these assertions, A2 is not a marking portion but a stress applying part, also the stress applying part A2 is not provided in the over clad layer. Moreover, the optical fiber in

FIG 14 is a polarization-maintaining fiber, but is not a polarization-maintaining photonic crystal fiber as recited in claim 1.

More specifically, the claimed invention is directed towards a polarization-maintaining photonic crystal fiber having a large number of thin holes arranged in a crystalline formation in a clad layer and because of this arrangement of the thin holes, a polarization plane of light are maintained in the core.

In contrast, Kawanishi discloses at col. 6, ll. 16-26,

[t]he optical fiber according to the present invention can be fabricated by applying the prior art polarization maintaining fiber fabrication technology. FIG. 14 shows the structure of a polarization maintaining fiber. In FIG. 14, reference numeral A1 indicates a core, A2 is a stress applying part, and A3 is a cladding. First, hollow holes are previously formed in parts corresponding to the stress applying parts A2 of an optical fiber preform before fiber drawing. Then the hollow hole parts are filled with a material for stress application, and thereafter the preform can be drawn to fabricate a polarization maintaining fiber.

There is no description about many thin holes arranged in the clad layer A3 the Kawanishi '966 patent. Moreover, the hollow holes in the stress applying parts A2 are filled with a material for stress application. Accordingly, no hole is formed in the optical fiber that is obtained by drawing the fiber from the preform.

Similarly, the description in column 6, lines 28-30, discloses that it is possible to fabricate the cladding of the photonic band gap structure using the same technique as used in fabricating the polarization-maintaining fiber in FIG 14. However, the technique is to form holes for filling with a material for stress application and does not suggest that the holes are formed in the polarization-maintaining fiber in FIG. 14.

The optical fiber in FIG 14 is not a polarization-maintaining photonic crystal fiber. The optical fiber in FIG 14 is a polarization-maintaining fiber, generally called a PANDA-type polarization maintaining fiber. In the PANDA-type polarization maintaining fiber the stress applying part A2 affects the light propagating in the core, thereby maintaining the polarization plane of the light.

Moreover, the stress applying part A2 applies stress to the core, acting on the light propagating in the core. Although the Examiner considers that A2 is provided in the over clad layer, it is hardly possible to place A2 in the over clad layer, Rather, the difference between a clad layer and an over clad layer is that the clad layer is provided around the core and affects light propagating in the core (e.g., keeps the light inside the core) while the over clad layer is provided around the clad layer


just to protect the clad layer and does not affect the light propagating in the core.

If provided in the over clad layer, the stress applying part A2 cannot act on the light propagating in the core. As a result, it becomes impossible to maintain the polarization plane of light. In other words, if the stress applying part A2 is provided in the over clad layer, the optical fiber in FIG. 14 is not a polarization-maintaining fiber. In practice, however, what FIG. 14 shows is a polarization-maintaining fiber as it is mentioned in column 6, lines 18-19. For this reason, the Examiner's understanding that the stress applying part A2 is provided in the over clad layer is not correct.

In view of the arguments set forth above, Applicants respectfully request reconsideration and withdrawal of all the pending rejections.

While the present application is now believed to be in condition for allowance, should the Examiner find some issue to remain unresolved, or should any new issues arise which could be eliminated through discussions with Applicants' representative, then the Examiner is invited to contact the undersigned by telephone in order that the further prosecution of this application can thereby be expedited.

Respectfully submitted,

  
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